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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

ZERVIGON, RUDY

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 12/26/2001

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/667,777

Applicant(s)

KOMINO ET AL.

Examiner

Rudy Zervigon

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 September 2000.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-14, 16-23 and 25 is/are rejected.
- 7) ☒ Claim(s) 4, 15, 24 and 26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 7, 12, 13, and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 requires "a base metal (page 8, lines 24-26; application specification) in which the heater and the ceramic-metal composites are cast". The Examiner believes that there are two possible interpretations for this requirement in light of the specification:

- a) The heater and the ceramic-metal composites have a common "base-metal", i.e. the composites and heater are cast<sup>1</sup> from a common "base-metal".
- b) The heater and the ceramic-metal composites are formed within and are contained by a "base-metal", i.e. the composites and heater are cast<sup>2</sup> in a "base-metal".

The Examiner believes that the specification, as cited from page 8, supports the use/misuse of "cast" as pertaining to composition:

"Then, molten aluminum as a base metal is poured into the mold 48 to infiltrate the porous SiC blocks 50, 52 with molten aluminum."

For the remainder of the action, the Examiner will interpret "cast" per the specification's usage pertaining to composition.

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<sup>1</sup> *n 2a*: the form in which a thing is constructed. Merriam-Webster's Collegiate Dictionary - 10th Ed. p.178 – Form, here, is interpreted as composition in light of page 8 of the specification

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***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1-3, 5-14, 16-23, and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Hirano et al (U.S.Pat. 6,120,661). Hirano et al teaches a method of casting an electrode wherein a heater is formed from molten aluminum forming a ceramic-metal composite (column 5, lines 17-31). Further, Hirano et al teaches:

1. An electrode (10; Figure 1A) comprising: a heater (15; Figure 1A; column 16, lines 23-38) arranged on a plane; a pair of ceramic-metal composites (11; Figure 1A; column 15, lines 56-65) each arranged above and below the heater respectively so that the heater is positioned therebetween; and a base metal (page 8, lines 24-26; application specification – “matrix” column 4, lines 51-65) in which the heater and the ceramic-metal composites are cast – Hirano et al teaches Ti or stainless steel (containing aluminum) for the heater’s material (column 12, lines 38-51) to match the thermal expansion of the supporting stage (10). Further, Hirano et al teaches 2.5% by weight of TiO<sub>2</sub> as a constituent of the ceramic layer 13 (column 18, line 66 – column 19, line 24) forming the supporting stage 10A that is also Al<sub>2</sub>O<sub>3</sub>

2. An electrode comprising: a heater arranged on a plane; a core metal plate (14) arranged substantially parallel to the plane and adjacent to the heater; and a base metal (Titanium) in which the heater and the core metal are cast.

3. The electrode according to claim 2, wherein a plurality of base metal communication holes (Figure 1C) are formed through the core metal plate (14).

5. The electrode according to claim 2, wherein the electrode is configured so that a high frequency voltage (32, Fig.13) is applied thereto.

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<sup>2</sup> *VT 4a*: to give a shape to (a substance) by pouring in liquid or plastic form and letting harden without pressure. Merriam-Webster’s Collegiate Dictionary - 10th Ed. p.178

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6. A susceptor comprising; a heater (15) arranged on a plane; upper and lower ceramic-metal composites (11; Figure 1A; column 15, lines 56-65) arranged so that the heater is positioned therebetween; and a ceramic electrostatic chuck (14, column 16, lines 23-38 – “brazing material”, column 14, lines 23-26) that attracts and holds an object to be treated, the electrostatic chuck having a coefficient of linear thermal expansion substantially the same as that of the upper ceramic-metal composite (column 14, lines 31-38), and being joined to an upper surface of the upper ceramic-metal composite.

7. The susceptor according to claim 6 further comprising a base metal in which the heater and the upper and lower ceramic-metal composites are cast – per the claim 1 citation:(page 8, lines 24-26; application specification – “matrix” column 4, lines 51-65) in which the heater and the ceramic-metal composites are cast – Hirano et al teaches Ti or stainless steel (containing aluminum) for the heater’s material (column 12, lines 38-51) to match the thermal expansion of the supporting stage (10). Further, Hirano et al teaches 2.5% by weight of  $\text{TiO}_2$  as a constituent of the ceramic layer 13 (column 18, line 66 – column 19, line 24) forming the supporting stage 10A that is also  $\text{Al}_2\text{O}_3$

11. The susceptor according to claim 6, wherein the susceptor is configured so that a high frequency voltage (32, Fig.13) is applied thereto.

12. A plasma processing apparatus comprising: a processing vessel (Figures 2,4,5,6, and 7); an electrode (10; Figure 1A) including: a heater (15; Figure 1A; column 16, lines 23-38) arranged on a plane; a pair of ceramic-metal composites (11; Figure 1A; column 15, lines 56-65) each arranged above and below the heater so that the heater is positioned therebetween; and a base metal in which the heater and the ceramic-metal composites are cast – per the claim 1 citation:(page 8, lines 24-26; application specification – “matrix” column 4, lines 51-65) in which the heater and the ceramic-metal composites are cast – Hirano et al teaches Ti or stainless steel (containing aluminum) for the heater’s material (column 12, lines 38-51) to match the thermal expansion of the supporting stage (10). Further, Hirano et al teaches 2.5% by weight of  $\text{TiO}_2$  as a constituent of the ceramic layer 13 (column 18, line 66 – column 19, line 24) forming the supporting stage 10A that is also  $\text{Al}_2\text{O}_3$

and a high frequency power sources that applies a high frequency voltage (32, Fig.13) to the electrode (10; Figure 1A).

13. A plasma processing apparatus comprising: a processing vessel, an electrode (10; Figure 1A) including: a heater (15; Figure 1A; column 16, lines 23-38) arranged on a plane; a core metal plate (14) arranged substantially parallel to the plane and adjacent to the heater; and a base metal in which the heater and the ceramic-metal composites (11; Figure 1A; column 15, lines 56-65) are cast; and a high frequency power source (32, Fig.13) that applies a high frequency voltage to the electrode.

14. The apparatus according to claim 13, wherein a plurality of base metal communication holes (Figure 1C) are formed through the core metal plate.

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16. A plasma processing apparatus comprising; a processing vessel, a susceptor (10, Fig.13) including: a heater (15; Figure 1A; column 16, lines 23-38) arranged on a plane: upper and lower ceramic-metal composites (11; Figure 1A; column 15, lines 56-65) arranged so that the heater is positioned therebetween: and a ceramic electrostatic chuck (14, column 16, lines 23-38 – “brazing material”, column 14, lines 23-26) that attracts and holds an object to be treated, the electrostatic chuck having a coefficient of linear thermal expansion substantially the same as that of the upper ceramic-metal composite (column 14, lines 31-38), and being joined to an upper surface of the upper ceramic-metal composite: and a high frequency power source (32, Fig.13) that applies a high frequency voltage to the susceptor.

17. The plasma processing apparatus according to claim 16, wherein the heater and the upper and lower ceramic-metal composites are cast in a base metal (page 8, lines 24-26; application specification – “matrix” column 4, lines 51-65) in which the heater and the ceramic-metal composites are cast – Hirano et al teaches Ti or stainless steel (containing aluminum) for the heater’s material (column 12, lines 38-51) to match the thermal expansion of the supporting stage (10). Further, Hirano et al teaches 2.5% by weight of  $\text{TiO}_2$  as a constituent of the ceramic layer 13 (column 18, line 66 – column 19, line 24) forming the supporting stage 10A that is also  $\text{Al}_2\text{O}_3$

18. The plasma processing apparatus according to claim 16, wherein the susceptor is provided with heat transfer gas passages (16) that supplies a heat transfer gas to a surface of the electrostatic, the passage passing through the susceptor.

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*Allowable Subject Matter*

3. Claims 4, 15, 24, and 26 would be allowable if rewritten to overcome the rejections under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

*Conclusion*

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S.Pat. 5,684,669; 5,571,366; 6,197,246.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.

  
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